PATENT ABSTRACTS OF JAPAN

(51)Int.Cl.

HO1M 14/00

HO1L 31/04

(21)Application number : 10-273742

(22)Date of filing : 28.09.1998

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(54) SEMICONDUCTOR FILM FOR PHOTOELECTRIC CONVERSION ELEMENT AND PHOTO-ELECTROCHEMICAL CELL

(57)Abstract:

PROBLEM TO BE SOLVED: To make use of diverse transparent carriers which have a low melting point or softening point by forming a semiconductor film with semiconductor fine particles, having at least two different particle size distributions and conducting coloring matter sensitizing after the semiconductor film is heat- treated.

SOLUTION: Large-size semiconductor fine particles (A) and small-size semiconductor fine particles (B) are contained, and difference between average particle sizes of them is 5 nm or more. The average particle size of the semiconductor fine particles (A) is 10 nm or more but 300 nm or less, and the average particle size of the semiconductor fine particles (B) is 10 nm or less. The ratio of the volume occupied by the semiconductor fine particles (B) is 0.1-30% with respect to the total volume. The semiconductor is titanium oxide. The temperature of heat treatment of a semiconductor film is 150-350°C, and a coloring matter used in coloring matter sensitizing is a metal complex and/or polymethine coloring matter. A conductive carrier is a polymer film on the surface of which a conductive layer is formed.

LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of

rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]